In the Claims:

1 - 19. (cancelled)

20. (original) A method of providing a virtual private network (VPN) service through a shared network infrastructure comprising a plurality of interconnected provider edge (PE) devices having customer edge (CE) interfaces, wherein some of the CE interfaces are allocated to a VPN supporting a plurality of virtual local area networks (VLANs) and are arranged for exchanging tagged data frames with CE devices respectively connected to the PE devices through said CE interfaces, each tagged frame including a VLAN identifier, the method comprising the following steps:

- receiving at least one tagged frame from a CE device at each CE interface allocated to said VPN, and learning a correspondence between said CE interface and each VLAN identifier included in said at least one tagged frame;
- detecting whether a pair of CE interfaces allocated to said VPN and belonging to two PE devices correspond to a common VLAN identifier; and
- in response to such detection, establishing at least one virtual circuit in the shared network infrastructure between said two PE devices, for forwarding frames including said common VLAN identifier.

21. (original) A method as claimed in claim 20, further comprising the following steps:

- establishing a respective flooding virtual circuit in the shared network infrastructure between each pair of PE devices having at least one CE interface allocated to said VPN;
- in response to reception of a first tagged frame including a VLAN identifier at a first CE interface, allocated to said VPN, of a first PE device, propagating said first tagged frame on each flooding virtual circuit established from the first PE device; and
- in response to reception of the first tagged frame on a flooding virtual circuit at another PE device, propagating the first tagged frame to each CE interface, allocated to said VPN, of said other PE device.

22. (original) A method as claimed in claim 21, wherein the correspondence between the first CE interface and the VLAN identifier is learnt in response to the reception of the first tagged frame including said VLAN identifier at the first CE interface.

23. (original) A method as claimed in claim 21, further comprising the following steps in response to the reception of the first tagged frame including said VLAN identifier at the first CE interface:

- allocating, at the first PE device, a first virtual circuit resource for said VPN and the VLAN identifier included in the first tagged frame;
- transmitting a first signaling message from the first PE device to each other PE device of the shared network infrastructure having at least one CE interface allocated to said VPN, said first signaling message indicating the first virtual circuit resource and said VPN and VLAN identifier; and
- in response to reception of the first signaling message at each other PE device, storing an identification of the first virtual circuit resource in association with said VPN and VLAN identifier.

24. (original) A method as claimed in claim 23, further comprising the following steps in response to reception of a second tagged frame including said VLAN identifier at a second CE interface, allocated to said VPN, of another PE device, whereby it is detected that the first and second CE interfaces both correspond to said VLAN identifier:

- allocating, at said other PE device, a second virtual circuit resource for said VPN and said VLAN identifier; and
- transmitting a second signaling message from said other PE device to the first PE device, thereby completing the establishment of a virtual circuit, defined by said first and second virtual circuit resource.

25. (original) A method as claimed in claim 24, wherein frames pertaining to said VPN and including said VLAN identifier are forwarded from the first PE device to said other PE device by means of the second virtual circuit resource, and frames pertaining to said VPN and including said VLAN identifier are forwarded from said other PE device to the first PE device by means of the first virtual circuit resource.

26. (original) A method as claimed in claim 24, wherein the first and second virtual circuit resources are labels of a multi-protocol label switching architecture of the shared network infrastructure.

27. (original) A method as claimed in claim 26, wherein the first and second signaling messages are in accordance with a label distribution protocol supported by the multi-protocol label switching architecture.

28. (original) A method as claimed in claim 24, further comprising the step of forwarding the second tagged frame to the first PE device by means of the first virtual circuit resource.

29. (original) A method as claimed in claim 28, wherein said second tagged frame is forwarded by the first PE device through the first CE interface, identified as corresponding to the VLAN identifier for which the first virtual circuit resource has been allocated.

30. (original) A method as claimed in claim 20, wherein the VPN has a topology such that at most two CE interfaces allocated thereto are allowed to receive tagged frames including a given VLAN identifier.

31. (original) A method as claimed in claim 20, wherein the CE interfaces allocated to the VPN are Ethernet interfaces.

32. (original) A method as claimed in claim 20, wherein said virtual circuits are label-switched paths of a multi-protocol label switching architecture of the shared network infrastructure.

33. (original) A method as claimed in claim 32, wherein the step of establishing a virtual circuit between two PE devices comprises exchanging messages of a label distribution protocol supported by the multi-protocol label switching architecture between said two PE devices.

34. - 48. (cancelled)

49. (original) A provider edge (PE) device for a shared network infrastructure, comprising:

- means for communicating with other PE devices through the shared network infrastructure;
- at least one local customer edge (CE) interface;
- configuration means for allocating at least one local CE interface to a virtual private network (VPN) supporting a plurality of virtual local area networks (VLANs), the

allocated local CE interface being arranged for exchanging tagged data frames with a respective CE device, each tagged frame including a VLAN identifier;

- means for learning a correspondence between a first local CE interface allocated to said VPN and a first VLAN identifier included in at least one tagged frame received from a CE device at said first local CE interface;
- means for identifying another PE device having a CE interface allocated to said VPN and having received a tagged frame including said first VLAN identifier; and
- means for establishing a virtual circuit in the shared network infrastructure, for communicating frames including said first VLAN identifier with the identified PE device.

50. (original) A device as claimed in claim 49, further comprising:

- means for establishing a respective flooding virtual circuit in the shared network infrastructure to each other PE device configured to have at least one CE interface allocated to said VPN; and
- means responsive to reception of a first tagged frame including the first VLAN identifier at the first local CE interface, for propagating said first tagged frame on each of the flooding virtual circuits established to said other PE devices.

51. (original) A device as claimed in claim 50, further comprising:

- means responsive to reception, on a flooding virtual circuit from another PE device configured to have at least one CE interface allocated to said VPN, of a tagged frame including a VLAN identifier for which no CE interface has been learnt, for propagating said tagged frame through any local CE interface allocated to said VPN.

52. (original) A device as claimed in claim 50, wherein the learning means are arranged to store the correspondence between the first local CE interface and the first VLAN identifier in response to the reception of the first tagged frame at the first local CE interface.

53. (original) A device as claimed in claim 50, further comprising:

- means for allocating a first virtual circuit resource for said VPN and first VLAN identifier in response to the reception of the first tagged frame at the first local CE interface;
- means for transmitting a first signaling message to each other PE device of the shared network infrastructure configured to have at least one CE interface allocated to said VPN, said first signaling message indicating the first virtual circuit resource and said VPN and first VLAN identifier.

54. (original) A device as claimed in claim 53, wherein the means for identifying another PE device are responsive to reception from said other PE device of a second signaling message indicating a second virtual circuit resource, said VPN and first VLAN identifier, whereby frames including said first VLAN identifier and received at the first CE interface are forwarded to the identified PE device on a virtual circuit by means of the second virtual circuit resource.

55. (original) A device as claimed in claim 54, wherein the first and second virtual circuit resources are labels of a multi-protocol label switching architecture of the shared network infrastructure.

56. (original) A device as claimed in claim 55, wherein the first and second signaling messages are in accordance with a label distribution protocol supported by the multi-protocol label switching architecture.

57. (original) A device as claimed in claim 49, wherein the VPN has a topology such that at most two CE interfaces allocated thereto are allowed to receive tagged frames including a given VLAN identifier.

58. (original) A device as claimed in claim 49, wherein each CE interface allocated to said VPN is an Ethernet interface.